GATES LEARJET CORPORATION

maintenance manual

CHAPTER

74

IGNITION

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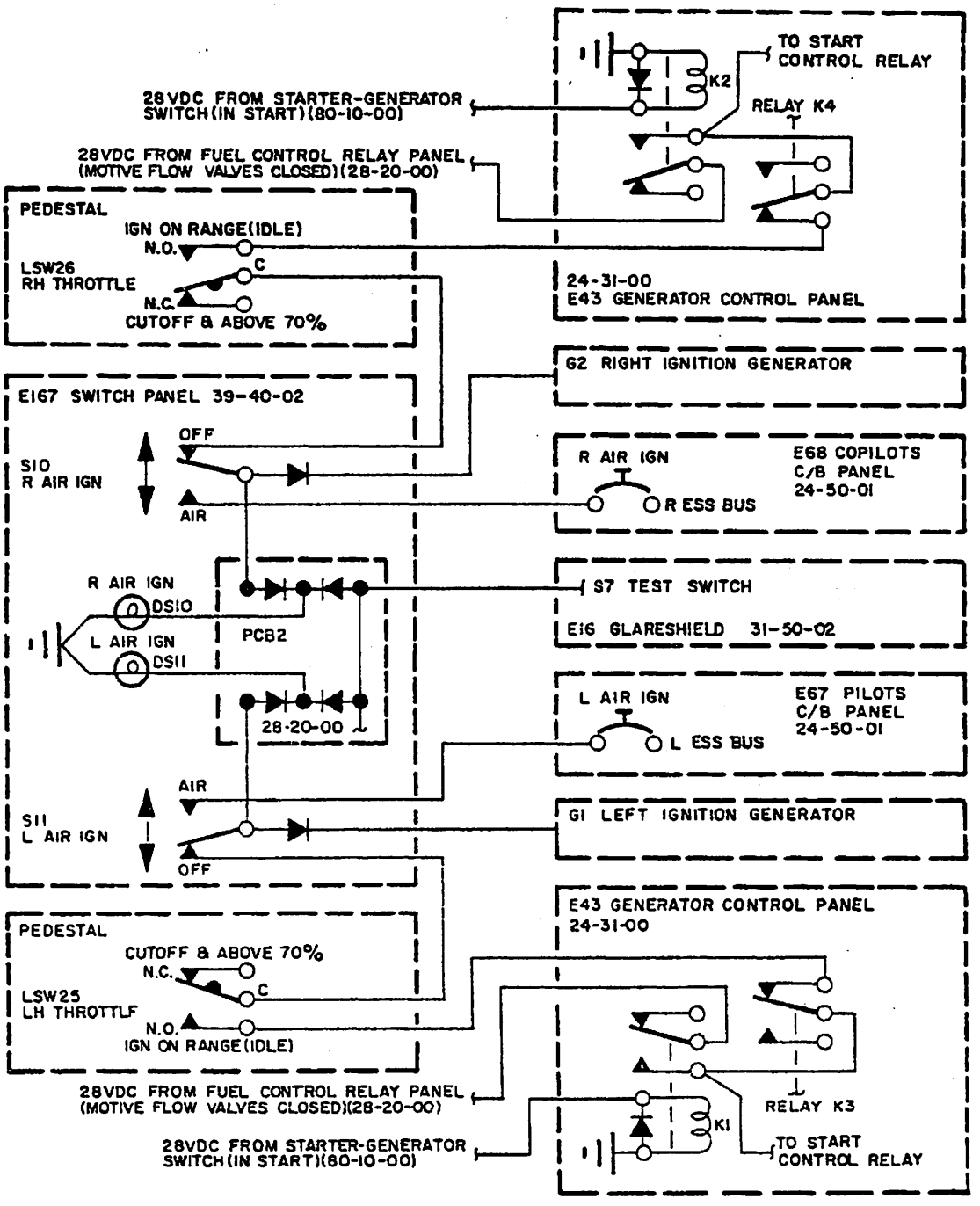
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IGNITION - DESCRIPTION AND OPERATION

1. Description
 - A. The ignition system operates on 24 vdc power and consists of an ignition unit, ignition leads, igniter plugs, two air ignition switches and indicator lights, two throttle (ignition) switches, and two 28 vdc circuit breakers.
 - B. This chapter covers maintenance practices on the air ignition switches, throttle switches, and the system circuit breakers. For maintenance practices on the ignition unit, ignition leads, and igniter plugs, refer to Engine Maintenance Manual.
 - C. The igniter unit is a radio-noise-suppressed, high-voltage, capacitor-discharge, intermittent-sparking-type unit. The ignition unit utilizes 28 vdc input to provide 800 volts output to the igniter plugs. The system is capable of continuous operation if required by flight conditions. The unit provides voltage to produce sparks at the approximate rate of two per second to each igniter lead.
 - D. The ignition leads are shielded, high-tension, flexible wires connecting the ignition unit and igniter plugs.
 - E. The ignition switches, one LH and one RH, are located within the control pedestal. The switches are actuated by the thrust levers above cutoff to 70% rpm.
 - F. The Air Ignition Switches, labeled L AIR IGN and R Air IGN, are located on the switch panel. The switches, normally in the OFF position, are used when conditions require continuous ignition operation. An indicator light (amber) above each switch illuminates when (1) the switch is set to ON, (2) power is applied to the ignition unit thru the switch in the OFF position from the left throttle switch, or (3) the TEST Switch on the lower LH edge of the glareshield is depressed.
 - G. The Air Ignition circuit breakers are located in the pilot's and copilot's circuit breaker panels and are labeled L AIR IGN and R AIR IGN respectively.

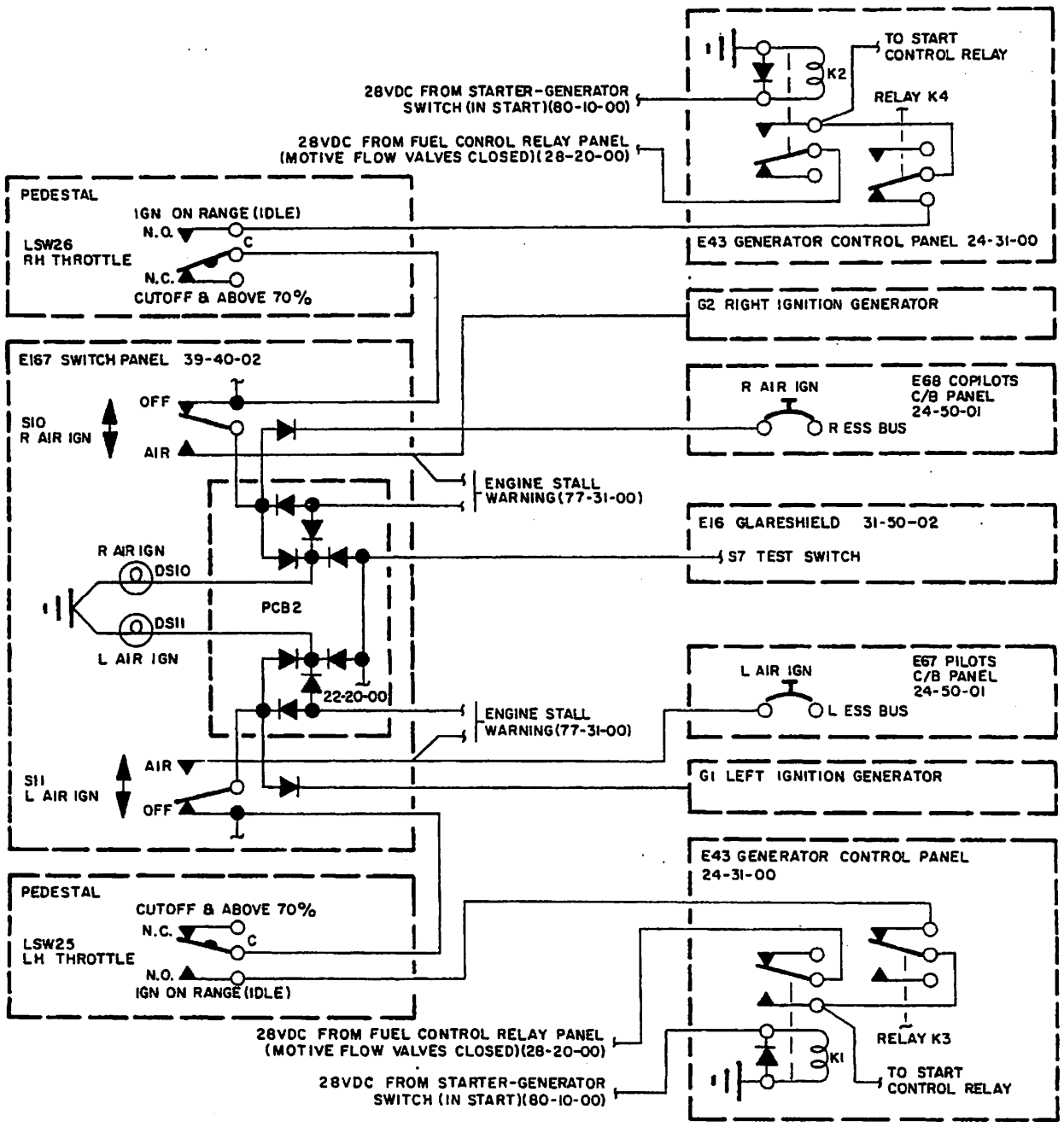
2. Operation (See figure 1)
 - A. During a start mode of operation (LH Starter-Generator Switch set to START), 28 vdc is applied to relay (K1) within the generator control box. With relay K1 energized, 28 vdc from the fuel control panel (motive flow valves energized closed) is applied to (1) the start control relay and (2) a set of deenergized contacts on relay (K3). Twenty-eight (28) vdc is applied thru the deenergized contacts of K3 to the N. O. side of the LH throttle switch. As the thrust levers are advanced from CUTOFF to IDLE, the throttle switch is actuated to the "ignition on range" (continuity) between N. O. and C.). This applies 28 vdc thru the throttle switch and Left Air Ignition Switch (in the OFF position) to the ignition unit on the engine. The Left Air Ignition indicator light will illuminate. After the engine is started (ignition becomes self sustaining), 28 vdc is removed from the throttle switch when

the Starter-Generator Switch is set to GEN. The Left Air Ignition indicator light will extinguish. Operation of the RH side is identical except relays K2 and K4 in the generator control box are utilized along with the RH throttle switch and the Right Air Ignition Switch and indicator light.



Ignition System Electrical Control Schematic
Figure 1 (Sheet 1 of 2)

B. On Aircraft 25-342, 25-363 and subsequent and prior aircraft modified per AMK 81-12 (Installation of Engine Stall Warning Box and Air Data Sensor), power is applied to the engine ignitors under stall warning conditions. (Refer to Chapter 77.)



Ignition System Electrical Control Schematic
Figure 1 (Sheet 2 of 2)

EFFECTIVITY: 25-342, 25-363 AND SUBSEQUENT and prior aircraft modified per AMK 81-12 (Installation of Engine Stall Warning Box and Air Data Sensor)

THROTTLE (IGNITION) SWITCH - MAINTENANCE PRACTICES

1. Removal/Installation

NOTE: The following procedures are applicable to either switch.

A. Remove Throttle (Ignition) Switch (See figure 201)
 (1) Remove knobs from thrust levers.
 (2) Remove attaching parts and pedestal cover.
 (3) Remove attaching parts and switches from pedestal.
 (4) Disconnect electrical wiring from switch. Tag wiring.

B. Install Throttle (Ignition) Switch (See figure 201)
 (1) Connect electrical wiring to switch.
 (2) Install switch and secure with attaching parts.
 (3) Install cover and secure with attaching parts.
 (4) Install knobs on thrust levers and secure.

2. Adjustment/Test

A. Throttle (Ignition) Switch Adjustment (See figure 201)

CAUTION: ADJUSTMENT OF THROTTLE SWITCHES MORE THAN 0.25 INCH (6.35 mm) BELOW IDLE DETENT COULD RESULT IN SWITCH DAMAGE WHEN THRUST LEVERS ARE PLACED IN IDLE.

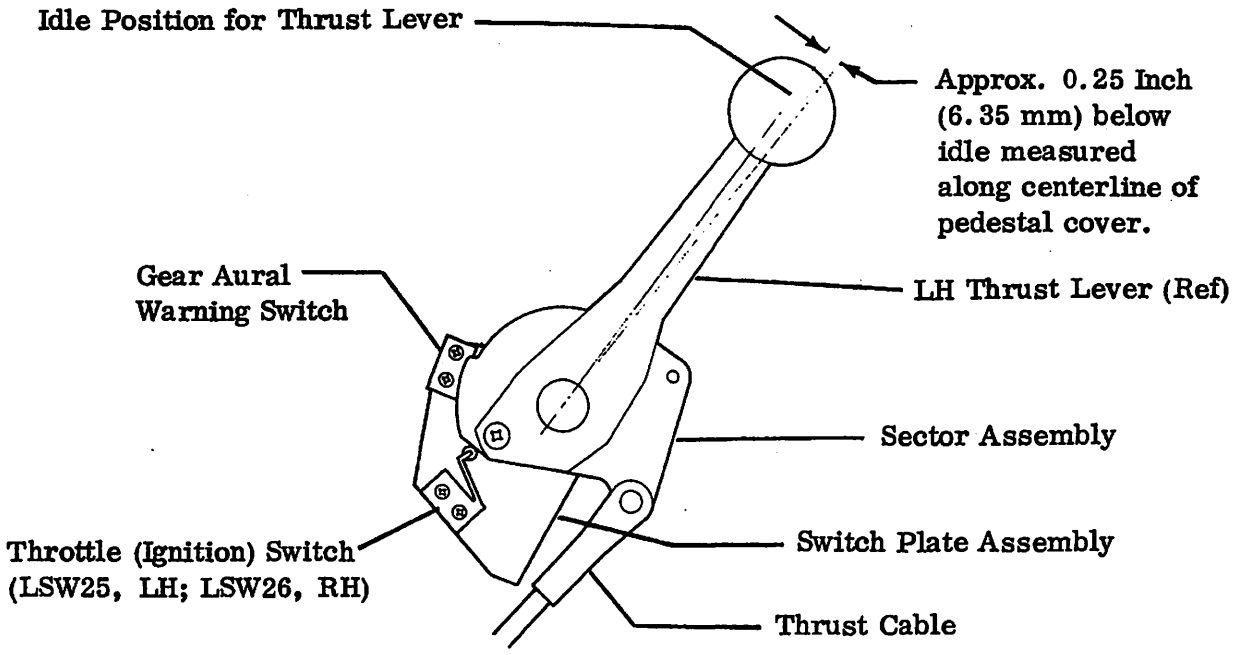
(1) Retard LH and RH thrust levers approximately 0.25 inch (6.35 mm) below idle detent as measured along contour of pedestal cover. Lock thrust levers in position by tightening friction knob.

NOTE: Setting thrust levers approximately 0.25 inch (6.35 mm) below idle detent and adjusting throttle switches to actuate at this position assures that throttle switches will be properly actuated when thrust levers are in idle detent.

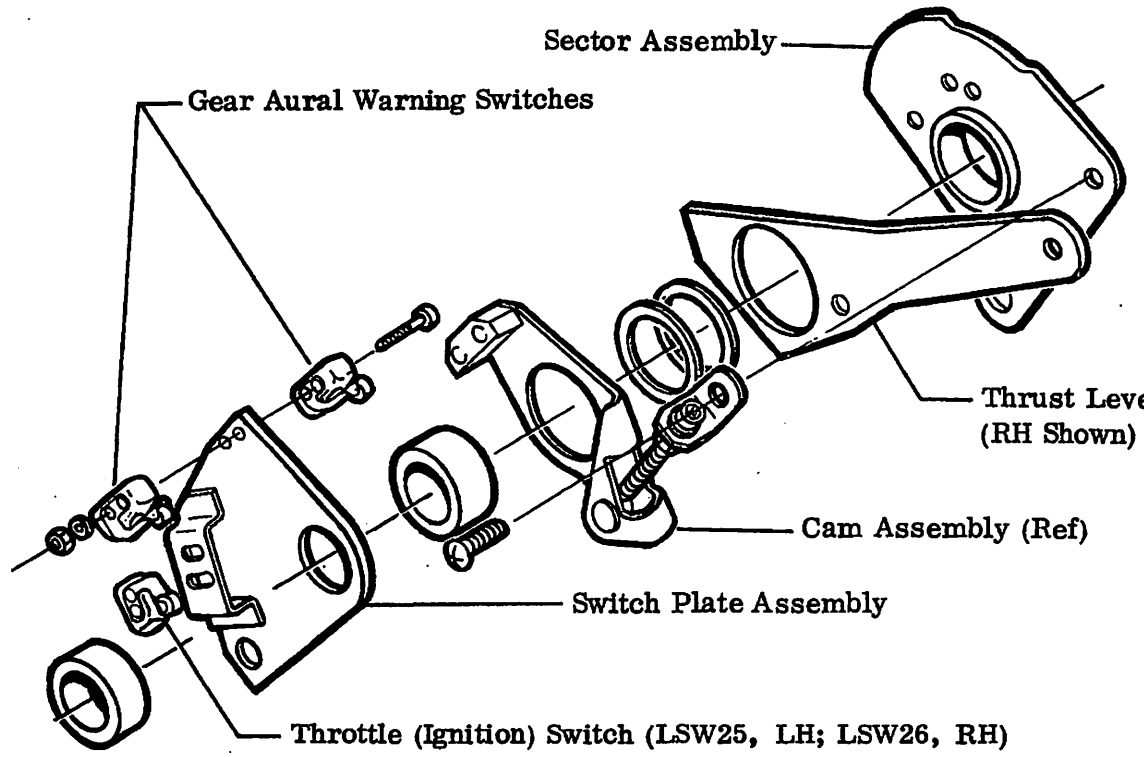
CAUTION: USE EXTREME CAUTION WHEN REMOVING PEDESTAL COVER SO AS NOT TO DAMAGE GO-AROUND SWITCH WIRING. THESE WIRES ARE VERY SMALL AND DELICATE AND CAN BE DAMAGED EASILY.

(2) Remove attaching parts and carefully remove pedestal cover. Do not disturb thrust lever setting.
(3) Connect ohmmeter to LH throttle switch terminals (N.O. and C.).
(4) Loosen throttle switch attaching parts and adjust switch for actuation (continuity between N.O. and C.). Tighten throttle switch attaching parts.

(5) Perform steps (3) and (4) for the RH throttle switch.
(6) Disconnect ohmmeter, install pedestal cover and secure with attaching parts.
(7) Disconnect attaching parts and remove fuel control panel from pedestal.
(8) Disconnect connector P116 from receptacle.
(9) Attach ohmmeter to pins P116-H and P116-J. Move LH thrust lever to CUTOFF then back to IDLE detent. Ohmmeter will show open circuit at CUTOFF and continuity at IDLE.
(10) Disconnect ohmmeter from P116-H and P116-J and connect to pins P116-K and P116-A. Move RH thrust lever to CUTOFF then back to IDLE detent. Ohmmeter will show open circuit at CUTOFF and continuity at IDLE.
(11) Disconnect ohmmeter and connect eletrical connector to receptacle.
(12) Install fuel control panel and secure with attaching parts.
(13) Check that 2 to 1.5 lbs (0.90 to 0.68 Kg) of force is required to move thrust levers with friction knob backed off completely against stop.
(14) Check Go-Around function of flight director system (if applicable).



VIEW LOOKING INBOARD AT LEFT SIDE OF PEDESTAL



Throttle (Ignition) Switch Installation
Figure 201

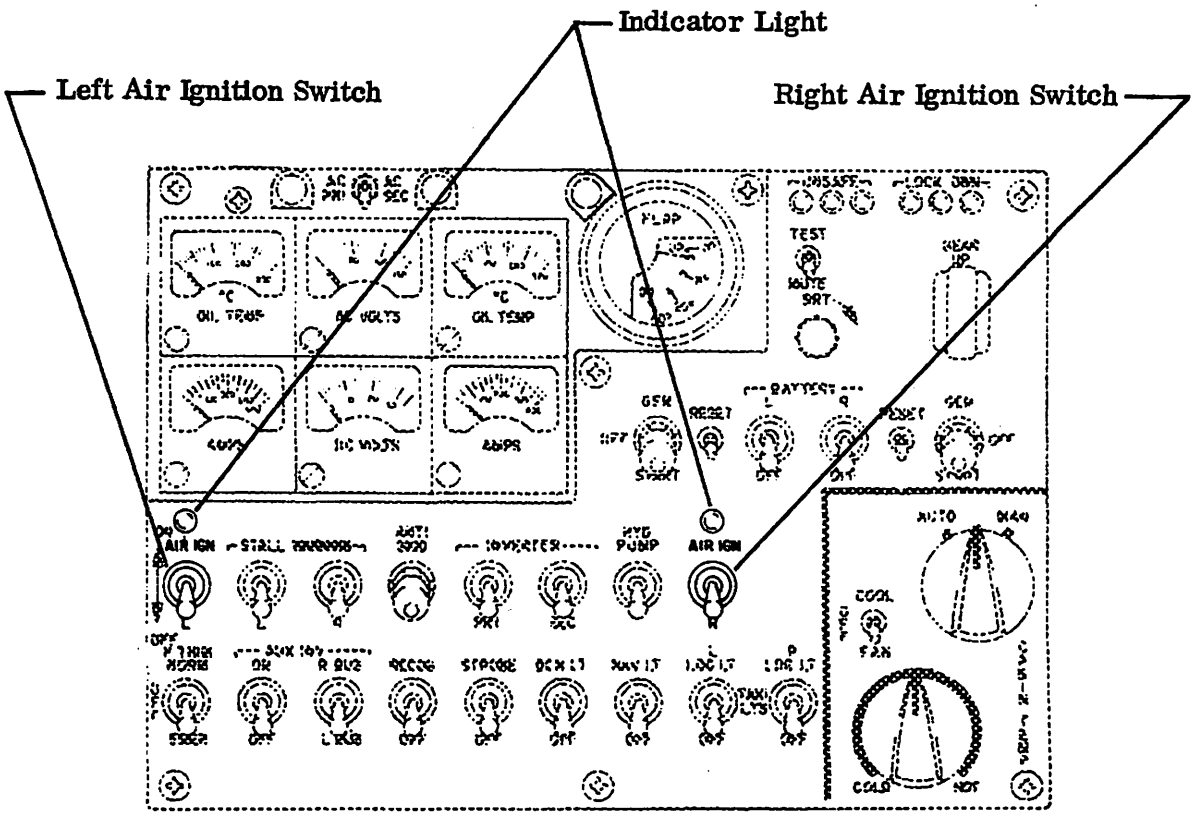
AIR IGNITION SWITCH - MAINTENANCE PRACTICES

1. Removal/Installation

NOTE: The following procedures are applicable to either switch.

A. Remove Air Ignition Switch
 (1) Remove attaching parts and remove switch panel sufficiently to gain access to the Air Ignition Switch.
 (2) Disconnect electrical wiring from switch.
 (3) Remove attaching parts and switch from switch panel.

B. Install Air Ignition Switch
 (1) Install switch and secure with attaching parts.
 (2) Connect electrical wiring to switch.
 (3) Install switch panel and secure with attaching parts.



Air Ignition Switch and Indicator Light
Figure 201